DOCUMENT RESUME

ED 435 681 TM 030 312

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TITLE Concurrent and Discriminant Validity of a Dynamic Assessment Procedure with Special Needs and Typical Preschool Children.
PUB DATE 1999-01-00
NOTE 37p.; Master's Thesis, Touro College.
PUB TYPE Dissertations/Theses - Masters Theses (042) -- Reports - Research (143)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Child Development; *Cognitive Processes; *Concurrent Validity; *Preschool Children; Preschool Education; Rating Scales; School Readiness; *Special Needs Students; Test Validity
IDENTIFIERS *Discriminant Validity; *Dynamic Assessment

ABSTRACT

The purpose of this study is to contribute information in the field of dynamic assessment regarding the Application of Cognitive Functions Scale (ACFS) (C. Lidz and R. Jepsen, 1996). The goal of this new procedure is to help establish a zone of proximal development and to assess the young child's emerging skills necessary for school learning. Other dynamic assessment procedures and their contributions to the field of psychology assessment are reviewed, and the need for this new procedure is established with a sample of 26 preschool children. Aspects of validity of the ACFS procedure were then studied. Although the study is limited, pretest to posttest gain scores were found, with some relationship between behavior during mediation and performance on the posttest. These provide evidence that the behavioral scale is reliable. An appendix contains the letter sent for parental consent for children to participate in the study. (Contains 4 tables and 34 references.) (SLD)

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CONCURRENT AND DISCRIMINANT VALIDITY OF A DYNAMIC ASSESSMENT PROCEDURE WITH SPECIAL NEEDS AND TYPICAL PRESCHOOL CHILDREN

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By:

Ruth Shurin

Thesis

Submitted to the Faculty of the

Graduate School of Education and Psychology

of Touro College

in partial fulfillment of the requirements

for the degree of

Masters of Arts

in

School Psychology

January, 1999

New York, New York

TM030312

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CONCURRENT AND DISCRIMINANT VALIDITY OF A DYNAMIC ASSESSMENT PROCEDURE WITH SPECIAL NEEDS AND TYPICAL PRESCHOOL CHILDREN

RUTH SHURIN

Thesis under the direction of Professor Dr. Carol Lidz

ABSTRACT

The purpose of this study is to contribute information to the field of dynamic assessment regarding the Application of Cognitive Functions Scale (ACFS). The goal of this new procedure is to help establish a zone of proximal development and to assess the young child's emerging skills necessary for successful school learning. This study first reviews other dynamic assessment procedures and their contributions to the field of psychology assessment and establishes the need for this new procedure, with a sample of twenty six preschool children. The study then investigates the aspects of validity of the ACFS procedure. It concludes, that although the study is limited, there are pre to post test gain scores, some relationship between behavior during mediation and performance on the post test, and evidence that the behavioral scale is reliable.

Approved:_____ Date:_____

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ACKNOWLEDGMENTS

This research project was successfully completed thanks to many persons who helped me at various stages. I wish to thank my supervisors at Crossroads School for Child Development - Jay, Vincent, Andrew and Renee for allowing me to use internship time to complete this research project and for all of their input and ideas. I'd also like to thank the two classroom teachers at Crossroads - Dee and Lisa who allowed me to interrupt their class to have their students participate in this project. A thank you also goes to the childrens' guardians who gave me permission for their children to be included in the study. I'd also like to thank the children themselves - who patiently allowed themselves to be tested. In addition, I wish to thank Dr. Lidz and Dr. Geleibter who helped me immensely with the actual writing and the statistics of the study.

I greatly appreciate the patience my family has shown me during the time it took to complete this paper. I'd also like to thank Yossi for believing me when I told him that I'll finish this paper before we get married. Most importantly, I'd like to thank G-D for giving me the strength and endurance to complete this paper.

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Introduction

Dynamic assessment is a testing procedure that embeds intervention within the assessment process (Lidz, 1991). The theory behind dynamic assessment stresses that learning ability as an aspect of intelligence is a process of change that is modifiable through intervention (Lidz, 1996a). This idea has roots in the theories of Vygotsky who termed the distance between the child's current, independent level of functioning and the child's level of potential development, the zone of proximal development (Rutland & Campbell, 1995). During the course of the assessment, it is the psychologist's goal to create and explore the child's zone of proximal development, so as to discover what the child can learn through effective intervention (Waters & Stringer, 1997). Related to this, the psychologist needs to determine which strategies and types of instruction facilitate learning or change in the child (Minick, 1987; Tzuriel, 1997).

As the psychologist, as assessor, is able to experience the child's ability to profit from instruction or intervention (Bolig & Day, 1993), the psychologist has a much better understanding of the child's functioning within the educational setting (Lidz, 1991). Understandably, dynamic assessment offers a means of linking assessment to the educational objectives of the classroom teacher (Campione & Brown, 1987; Lidz & Thomas, 1987).

Despite the potential relevance of dynamic assessment for educational settings, there are only a limited number of procedures currently available. There is general agreement among writers in the area of dynamic assessment that this approach would be beneficial to the young child (e.g., Day, Engelhardt, Maxwell & Bolig, 1997; Haywood, Tzuriel & Vaught, 1992; Lidz, 1996a). For example, procedures for the young child would help educators make decisions about the nature of the child's cognitive functions (Tzuriel, 1997), as well as help to determine if

metacognitve and executive processes have started to emerge (Lidz & Thomas, 1987; Mearig, 1987).

One procedure that is in the process of development for use with young children is the Application of Cognitive Functions Scale (ACFS) (Lidz & Jepsen, 1996). The goal of the ACFS is to help establish a zone of proximal development and to assess the young child's emerging skills necessary for successful school learning.

As this procedure is new, the purpose of this study is to contribute to the information regarding its concurrent and discriminant validity. Specifically, this study will explore both concurrent and discriminant validity of the ACFS.

Research Review

Overview of Dynamic Assessment

Traditionally the role of the school psychologist has been to test children for placement in special education classes. Recently this gatekeeper role has come under careful scrutiny, as both professionals and the public have started questioning the relevance of the existing measures for classroom instruction (Laughon, 1990). Therefore, school psychologists have started broadening their roles to include interventions other than placement, trying to increase the relevance of their assessments for educational practice (Lidz, 1997).

One of the more recently developed models of assessment that has tried to improve the relationship between assessment and intervention is dynamic assessment. Dynamic assessment differs dramatically from traditional intelligence tests that focus on learning products, existing skills, and previous achievements (Day, Engelhardt, Maxwell & Bolig, 1997; Haywood, Tzuriel & Vaught, 1992; Lidz, 1991; Spector, 1992). Dynamic assessment follows a pretest - intervention - posttest format, that embeds intervention within the assessment, in order to estimate the extent of learning modifiability of students (Bolig & Day, 1993; Lidz, 1991). This approach also provides information about which cognitive functions generalize or transfer to similar, though not identical, problems (Haywood, Brown & Wingenfeld, 1990). As such, dynamic assessment provides a sample of the learner in the act of learning (Lidz, 1996a). Information about the learner as a learner and the response of the learner to attempted interventions is likely to yield information that meaningfully relates to classroom learning and instructional planning.

Vygotsky, a Russian psychologist who wrote most of his work during the post

revolutionary years, believed that, although two children may seem to be on the same level, one child may be already developing skills that are revealed only when encouraged by an adult under the adult's guidance or in collaboration with a more capable peer. Vygotsky termed this distance between actual developmental level and level of potential development, the zone of proximal development. Since these skills are emerging, the child will need assistance to perform them. As the child increases in competence, the fewer the skills he would need to solve a problem (Ferrara, Brown & Campione, 1986). Therefore, it is incomplete to assess a child through a technique that analyzes the child's performance only when working alone (Minick, 1987).

A careful study of the idea of zone of proximal development reveals that not only do dynamic assessors believe that emerging functions can be seen when children are working with others (Minick, 1987), but that cognition itself is dynamic and is subject to change (Haywood, Tzuriel & Vaught, 1992). Cognition is defined here as both a person's current level of functioning and responsiveness to intervention, that is, a combination of the zones of actual and potential development (Lidz, 1991). As such, through various forms of intervention and given the right opportunity and the best possible conditions, a person's ability is modifiable (Laughon, 1990), for ability is a series of processes that are subject to change in the context of available interactions (Haywood, Tzuriel & Vaught, 1992).

Dynamic assessment differs from other approaches in its focus on learning processes and developing skills (Day, Engelhardt, Maxwell & Bolig, 1997; Minick, 1987). This approach takes a positive, holistic view of the child (Tzuriel, 1992), highlighting what the child can learn rather what he does not know (Bolig & Day, 1993). Dynamic assessment focuses on the child's ability to improve and change (Lidz, 1987).

Purpose of Dynamic Assessment

Dynamic assessment is a generic term for procedures that directly link assessment to intervention (Haywood, Tzuriel & Vaught, 1992; Lidz, 1987). Dynamic assessment has the potential to generate information that informs intervention programs (Bolig & Day, 1993). As the child is doing the assessment task, the assessor can observe the child's strengths and weaknesses (Waters & Stringer, 1997). These strengths and weaknesses emerge in relation to tasks that tap cognitive processes such as how the child defines, analyzes and solves problems, or the specific approaches to task solution that work well for this child (Haywood, Brown & Wingenfeld, 1990). The assessor observes the child's behaviors, and cognitive difficulties (Tzuriel, 1997), as well as the child's responsiveness to remediation (Lidz, Jepsen & Miller, 1997). All these observations help the psychologist understand the child within the educational setting (Lidz, 1991), to communicate more effectively with the child's teachers (Tzuriel, 1992), and to help the teachers work within the child's zone of proximal development in the classroom (Lidz, 1997).

Dynamic assessment is advantageous for a number of reasons. Because it focuses on success, it promotes the match between the nature of the learner and what is required of him (Lidz, 1991). In addition, dynamic assessment, as its name implies, assesses processes rather than products as it measures the change that is taking place within the testing session (Day, Engelhardt, Maxwell & Bolig, 1997). This is accomplished by judging the child's ability to profit from instruction (mediation) as seen by the improvement on posttest scores (Bolig & Day, 1993). This becomes a miniature picture of the possible changes within the child's capability (Tzuriel, 1992) and helps determine how to teach the child by discovering what the child can learn through effective mediation (Lidz, 1987; Waters & Stringer, 1997). Dynamic assessment procedures also

provide information about the strategies and kinds of instruction that facilitate learning or change in the child (Minick, 1987; Tzuriel, 1997).

Furthermore, dynamic assessment helps to identify the obstacles and cognitive deficiencies responsible for the difficulties of the learner (Haywood, Brown & Wingenfeld, 1990; Tzuriel, 1992; Tzuriel, 1997). Because dynamic assessment creates a zone of proximal development and addresses learning processes that undergird performance, it provides information that relates to metacognitive issues of how students can learn how to learn (Campione & Brown, 1987; Lidz, 1987; Tzuriel, 1997).

Limitations of Dynamic Assessment

As with any phenomenon, dynamic assessment has both advantages and disadvantages. Although the advantages are considerable, before one uses a dynamic assessment measure, it is necessary to be aware of the disadvantages as well.

A major limitation of dynamic assessment is the time factor entailed, as most measures take a significant amount of time to administer (Swanson, 1996). In addition, because dynamic assessment procedures often deviate from the American Psychological Association's standards of assessment, these measures are slow to become recognized as legitimate assessment devices (Guthke, Beckmann & Dobat, 1997). Additionally, many hours of training are needed, as mastery of most measures goes beyond the reading of directions and learning of scoring rules (Swanson, 1996), and some require the assessor to create spontaneous interventions (Tzuriel, 1997).

Also, most of the dynamic assessment devices are language based, as the interventions are mediated through language. For children with linguistic problems, this can put them at a disadvantage (Swanson, 1996).

Validity of Dynamic Assessment

The validity of a test refers to the extent to which a test measures what it is supposed to measure. Specifically, concurrent validity refers to whether test scores are related to some other measure that purports to tap the same (or similar) trait. Predictive validity refers to the correlation between test scores and performance on a relevant criterion, such as achievement (Sattler, 1992).

Several factors may affect validity, some of which are related to the individual. Examples include test taking skills, anxiety, motivation, speed, rapport and comprehension of test instructions (Sattler, 1992). Other factors that may affect validity are related to the test, such as the reliability of the test or the consistency of the measure (Salvia & Ysseldyke, 1995).

The validity of most dynamic assessment measures is not yet well established (Rutland & Campbell, 1995), or there is lack of information about their validity, or they are validated on tasks with weak correlations to measures of intelligence (Swanson, 1996). These validation problems are usually due to the broad goals of dynamic assessment (Tzuriel, 1992) as well as to the many dimensions that have to be validated with different criterion and validation experiments (Tzuriel, 1997). In addition, the goal of dynamic assessment is to facilitate and explore change in individuals. Therefore, the very nature of dynamic assessment is contrary to a number of the basic psychometric approaches to determination of validity and reliability.

The most relevant method to assess the validity of dynamic assessment measures can be to predict learning outcomes when the results of the dynamic assessment measures are used to develop adaptive instruction for each child (see Feuerstein, Hoffman & Rand, 1979). However, there is some evidence that dynamic assessment measures are as good as or better predictors of standardized achievement scores than static measures (e.g., Guthke, Beckmann & Dobat, 1997).

There is some evidence that dynamic measures may show differential results for different levels of functioning, possibly offering stronger predictive validity for children with lower levels, though this trend is not as yet firmly established (Rutland & Campbell, 1995).

Specific Procedures

There are many dynamic assessment procedures available, each targeting different populations, with different goals and therefore different psychometric properties. One of the more well known procedures is Feuerstein's Learning Potential Assessment Device (LPAD) (Feuerstein, Hoffman & Rand, 1979). The LPAD was designed to sample the modifiability of the child's cognitive style characteristics with the hope of increasing the child's participation in the main culture through exposure to a mediation- based intervention program. The LPAD assumes that as structural changes develop, the child becomes more autonomous and the dependance needed to perform a task is reduced (Feuerstein, Rand, Jensen, Kaniel & Tzuriel, 1987).

Swanson (1992), too, has developed a dynamic assessment procedure, whereby a graduated series of prompts and hints are given to the child when he answers the question incorrectly. Although the Swanson- Cognitive Processing Test does not include all processes that underlie academic domains or thinking, as it focuses on working memory, it is a good predictor of achievement (Swanson, 1995), specifically of reading scores (Swanson, 1992).

Budoff's Learning Potential Assessment Procedure, a standardized dynamic assessment measure (Budoff, 1987), assumes that some educable mentally retarded students may be incorrectly classified and may be more capable of learning than IQ scores suggest. As this procedure is quantifiable, it has been more readily accessible to demonstration of predictive validity in relation to academic achievement.

Campione and Brown (1987) offer yet a different approach, using a series of predetermined graduated prompts. They assume that the higher the ability that a person has, the fewer the hints that are needed to achieve a correct answer. They therefore count the number of prompts needed to accomplish a variety of tasks, including those of inductive reasoning, progressive matrices, series completion, reading and listening comprehension (Campione & Brown, 1987). These authors have found significant relationships between the number of prompts needed for problem solution and IQ scores, indicating that there is some degree of concurrent validity (Laughon, 1990).

Measures of Dynamic Assessment for Young Children

While there is a variety of dynamic assessment procedures available for use with school age and adult clients, there remains a paucity of procedures appropriate for application with young children (Lidz, 1991). Since metacognitive processes start emerging around the age of three, it is relevant to conceive of dynamic assessment approaches for use with preschool age children. Among those researchers who have applied dynamic assessment with younger children are Burns (Burns, Delclos, Vye & Sloan, 1996), Mearig (1987), Tzuriel and Klein (1987) and Waters and Stringer (1997).

Burns, Delclos, Vye & Sloan (1996) applied the dynamic assessment principles to children between the ages of 3 years 11 months and 8 years 2 months. In this study, the children were given the Stencil Design Test-1 of the Arthur Point Scale of Performance Tests Form 1940 Revision. In this task, the child had to use two stencils to recreate a design. The handicapped children who were given mediation dynamic assessment, compared to the control group who were given standard assessment, made significant increases between their pre and posttest scores

(Burns, et. al., 1996).

Mearig (1987) designed a downward extension of Feurstein's LPAD for application to children between the ages of five through eight. She found that most kindergarten children following mediation, were able to complete tasks they were unable to do before the mediation. The purpose of Mearing's modifications was to assess the children's current status and to provide a format to teach the next few stages of emerging cognitive functions.

Tzuriel and Klein (1987) also applied the principles of Feuerstein's Learning Potential Assessment Device to young children. They designed and administered the Children's Analogical Thinking Modifiability instrument to kindergartners ranging in ages from 4 years 0 months to 6 years 6 months. Their research documented larger pretest to posttest gains by both non-disabled and disadvantaged children than by children in special education and children with mental retardation (Tzuriel, 1992).

Waters & Stringer (1997) proposed a dynamic measure for children between the ages of 6 months and 4 years 5 months. This procedure, called the Bunny Bag, involves presenting the child with familiar toys in an attempt to judge on what level the child explores the toy, how adept the child is in learning the use of the toy and to what extent the child can be encouraged to use the toy with greater precision and accuracy. As such, this Bunny Bag procedure provides an estimated developmental age, an account of emerging cognitive functions and the amount of mediational support the child requires. The validity of this procedure has not as yet been explored.

There are special challenges and specific issues in attempting to apply dynamic assessment to young children. For example, the tasks and materials must be developmentally

appropriate. The materials must be attractive, manipulative and game like (Lidz & Thomas, 1987). The procedure must adapt to the child's short attention span and to the child's means of communication, which may not be fully developed (Tzuriel, 1997). The goal of dynamic assessment, though, is the same for all ages: to provide insight into the modifiability of the child, and to inform instruction or interventions (Minick, 1987). While these procedures are appropriate for use with young children they all are generic in content and do not link directly with preschool curriculum goals and demands.

To address the gap in the availability of dynamic assessment procedures for use with very young children (below kindergarten age), Lidz and Jepsen (1996) have developed the Application of Cognitive Functions Scale (ACFS). The goal of ACFS is to assess the child's responsiveness to instruction and mastery of cognitive processes and learning strategies that are directly related to early academic skills (Lidz & Jepsen, 1996). The ACFS also includes ratings of the child's behaviors on seven dimensions during the pretest and intervention phases of the assessment.

Since the ACFS is a new procedure, its psychometric properties remain to be explored. To date one study with high functioning children, ages four and five years, documented the appropriateness of the tasks for young children, as well as significant pre to post test gains for most of the subtests. Modifications of the ACFS resulted from this study (Lidz, personal communication).

This is a study of the concurrent and discriminant validity of the Application of Cognitive Functions Scale (ACFS) (Lidz & Jepsen, 1996).

The specific questions of this study are as follows:

(1) Is there a significant gain between the pretest and posttest scores? According to the

principles of dynamic assessment, there should be an increase in scores from pretest to posttest.

(2) Is there a significant relationship between the child's behavior ratings during mediation, and the child's ACFS posttest task score? This looks at how the child's behaviors across the tasks relates to their ratings on the behavior rating scale.

(3) Is there a significant relationship between the specific behavior ratings demonstrated during the mediation phase and the ACFS task total posttest score?

(4) Is there a significant relationship between the ACFS total task score and traditional IQ as measured by the Differential Ability Scales (DAS) (Elliot, 1990)? This provides an estimate of concurrent validity of the ACFS in relation to another procedure purporting to assess cognitive functioning.

(5) What is the intratest reliability of the behavior observation scale? This assesses the degree to which each of the seven behavioral dimensions contribute to the total behavioral score.

In addition, this study investigates the discriminant validity of the ACFS by estimating the procedure's success with differentiating between children with special needs and those with typical development. The study will look at these relationships in relation to both the composite, as well as the subtest scores of the ACFS.

Method

Participants

The participants in this study were twenty six preschool children between the ages of four and five years. These preschoolers attended Crossroads School for Child Development, a therapeutic preschool for developmentally challenged children. These preschoolers were enrolled in two classes of children diagnosed with minimal delays. The children in one of the classes functioned at a higher level than the other; this was the integrated class, where half the children were developing typically and were considered to be "day care" students. Therefore, the total population tested included five regular education children and twenty-one children with special needs, labeled "preschoolers with disabilities". The special needs of these labeled children ranged from mild developmental delays, speech and language delays to emotional problems. The participants' background and socioeconomic class varied across the range of middle to lower class.

Measures

The Differential Ability Scales (DAS) (Elliot, 1990) is an individually administered battery of cognitive tests used to measure skills related to educational needs. The cognitive battery of the preschool level consists of four subtests. The first subtest, Block Building, measures a child's ability to visually and perceptually match the assessor's models of various block designs. Verbal Comprehension measures the child's receptive language. Picture Similarities measures the child's non verbal reasoning abilities and Naming Vocabulary measures the child's expressive language skills (Elliot, 1990).

The Application of Cognitive Functions Scale (ACFS) (Lidz & Jepsen, 1997) is a

dynamic assessment procedure that addresses foundations for learning as well as nonintellectual factors. This measure, developed for children ages three to five, consists of six subscales:

(1) Classification - measures the child's ability to group and classify blocks with varying attributes.

(2) Perspective Taking - measures the child's ability to communicate in a way that reflects understanding of another person's point of view.

(3) Short Term Auditory Memory - measures the child's short term auditory recall and sequential narrative of a short story.

(4) Short Term Visual Memory - measures the child's ability to recall a series of small toys.

(5) Verbal Planning - measures the child's ability to communicate a strategic plan for the completion of a familiar activity.

(6) Sequential Pattern Completion - measures the child's ability to complete repeated sequential patterns.

The children's behavior during the mediation phase is rated for each subtest on seven dimensions. (Although the children's ratings on the pretest phase are usually done, they are not available for this study.)

(1) Self Regulation: the extent of the child's ability to self regulate and/or inhibit impulsive responding.

(2) Persistence: the extent of the child's persistence to complete the task.

(3) Frustration Tolerance: the child's ability to regain compliance when experience frustration related to task difficulty.

(4) Flexibility: the child's attempt towards alternative solutions or self correction while solving tasks.

(5) Motivation: the extent of the child's affective response/reaction or interest in task or materials.

(6) Interactivity: the extent of the child's reciprocal social interaction.

(7) Receptivity: the extent of the child's openness to experiencing intervention by the mediator.

Procedure

The procedure for this study started with requesting that teachers provide a list of students who would be appropriate candidates for this study. All the children in the day care were selected, as well as the students who the teachers determined to have sufficient verbal expressive ability for the scale. Only children ages four and five (or who had just turned five) were selected. At first a letter was sent home to parents of the selected children, explaining the general procedure [Appendix A]. Before actual individual testing, the child's parent (or legal guardian) was called to obtain verbal consent. While the school obtains a blank consent to test from parents at entry, specific consent for this project was obtained by phone to assure that the parent was aware of the child's participation in this project. The children were individually tested over two sessions, consisting of about an hour to an hour and a half each, by the author of this study. Additional protocols were available from testing by a previous school psychology intern. The child's background information and DAS scores were obtained from file review.

The author of the study learned how to administer the ACFS from the scale's first author. The learning procedure included watching Dr. Lidz do a live demonstration with a child, as well

as watching a recorded video of the procedure. Dr. Lidz then watched the author administer the test, both in person and on video. Scoring was done by both Dr. Lidz and the study author to assure correct scoring procedure.

Results

Data Analysis

The research questions of the study and the analyses for each follows.

First, is there a significant gain between the pretest and posttest scores? A paired sample t-test was computed to see if there were significant gains between the participants' pre and post test scores, as seen in Table 1.

TABLE 1

Pre to Post Test Gains on the ACFS (N = 25/26)

Subtest	Pre Mean(SD)	Post Mean(SD)	df	t
Classification	3.15(1.26)	3.69(1.09)	25	3.38**
Perspective Taking	3.56(2.40)	4.64(2.36)	24	2.65**
Auditory Memory	4.38(2.86)	5.19(3.30)	25	1.41
Visual Memory	5.81(2.26)	6.88(2.86)	25	1.92
Verbal Planning	4.88(3.05)	6.15(3.16)	25	2.42*
Pattern Completion	6.88(4.01)	9.69(6.12)	25	3.86***
Total ACFS	28.96(7.71)	36.80(9.97)	24	6.51**

* $p < .05$ ** $p < .01$ *** $p < .001$

As this was a computation of scores for 26 participants, the mean score for both pre and post test was used, with one exception. Due to an incomplete protocol for one participant, the N used to compute the t-test for the subtest perspective taking, as well as for the total ACFS score was 25.

Table 1 shows that there were significant positive gains from pretest to posttest for the

total ACFS task score and for four of the six subtests. The auditory and visual memory scores did not show significant increases.

The second question asks, is there a relationship between the child's behavior ratings during mediation, and the child's ACFS posttest score? A pearson product moment correlation was computed to test this relationship, as seen on Table 2.

TABLE 2

Pearson Product Moment Correlation between Behavior Observation Rating Total and ACFS Post Test Task Scores (N = 25/26)

Subtest	Task Score(SD)	Mean Behavior Rating(SD)	df	r
Classification	3.69(1.09)	1.49(.31)	25	.28
Perspective Taking	4.64(2.36)	1.56(.36)	24	.27
Auditory Memory	5.04(3.27)	1.38(.42)	24	.17
Visual Memory	6.88(2.86)	1.52(.34)	25	.43*
Verbal Planning	6.15(3.16)	1.46(.39)	25	.64***
Pattern Completion	9.69(6.12)	1.38(.39)	25	.39*
Total ACFS	36.8(9.97)	8.5(1.40)	24	.65***

* p.< .05 **p < .01 ***p < .001

Because behavioral ratings were not scored for all tasks, the correlation was computed using the mean of behavior during that particular subtest. For example, only some tasks provided opportunities for flexibility, and only some students showed signs of frustration, that is some behavioral components were relevant for some tasks and for some students while others were

not. As there were some incomplete protocols the N used to compute the correlations for the total score, perspective taking and auditory memory were 25.

Table 2 shows that there were significant positive relationships between the behavior observation rating total score and the ACFS post test task score for the total ACFS task score and three of the six subtests. Classification, perspective taking and auditory memory did not show significant relationships with the behavior rating scale.

The third question: Is there a significant relationship between the specific behavior ratings demonstrated during the mediation phase and the ACFS task total posttest score? These results appear in Table 3.

TABLE 3

Pearson Product Moment Correlation between Total Behavior Observation Ratings and Total ACFS Post Test Scores

Behavior Category	Mean Behavior Rating(SD)	df	ACFS Post Test Score(SD)	r
Self Regulation	1.3(.35)	24	36.8(9.9)	.11
Persistence	1.5(.40)	24	36.8(9.9)	.56**
Frustration Tolerance	1.3(.49)	13	33.6(9.4)	.52****
Flexibility	1.1(.46)	24	36.8(9.9)	.61***
Motivation	1.7(.30)	24	36.8(9.9)	.23
Interactivity	1.8(.31)	24	36.8(9.9)	.005
Receptivity	1.4(.40)	24	36.8(9.9)	.27

* $p < .05$ ** $p < .01$ *** $p < .001$ **** $p = .056$

As this was a computation of scores for behaviors that were not present during all subtests, the correlation was computed using the mean of the behavior during all subtests. As one participant did not have a complete protocol for his posttest score, the N for most of these correlations is 25. As many participants did not receive any score for the frustration tolerance behavior (as there was no frustration involved) the N for frustration tolerance is equal to 14.

Table 3 shows that there were significant positive relationships between total behavior observation rating score and total ACFS post test score on three of the seven dimensions - flexibility, frustration tolerance and persistence.

The fourth question: Is there any relationship between the ACFS score and an IQ score as measured on the Differential Ability Scales? A pearson product moment correlation was computed to determine this relationship. The most recent IQ score found in the child's file was used for this computation. For the few children who did not have a DAS score, but who did have some other standardized measure of IQ (the Bayley Scales of Infant Development) the standard score was converted to enable comparison with the DAS score. As five of the twenty six children were day care children who were not given an IQ test, the assumption was made that these children functioned at average level, and therefore assigned an IQ of 100 to enable comparison. The correlation was computed twice - once for only the special education children and once for all the children inserting a DAS score of 100 for the day care children. As one special education child did not have an IQ score in his file, the N is equal to 25.

A curious result of this computation is that none of these relationships were significant.

The fifth question: What is the intratest reliability of the behavior observation scale? A pearson product moment correlation was computed to study each behavior component's

contribution to the total average of behavior scores. These results appear in Table 4.

TABLE 4

Pearson Product Moment Correlation between the

Specific Type of Behavior and Total Mean of Behavior Ratings

Behavior Category	Correlation with Total Behavior(SD)
Self Regulation	.59(.35)***
Persistence	.75(.40)***
Frustration Tolerance	.78(.47)***
Flexibility	.85(.46)***
Motivation	.57(.30)**
Interactivity	.37(.26) (p = .06)
Receptivity	.57(.39)**

* $p < .05$ ** $p < .01$ *** $p < .001$

As many participants did not receive any score for the frustration tolerance behavior (as there was no frustration involved) the N for frustration tolerance was equal to 15.

Table 4 shows that there were positive relationships between the specific type of behavior and the total mean of behavior ratings for six of the seven behavior categories. Only interactivity did not show a significant relationship with the total mean of behavior ratings.

Does the ACFS differentiate between children with special needs and those with typical development? An independent sample t-test was computed to study this hypothesis. None of the computations were significant.

Discussion

This study investigated the concurrent and discriminant validity of a new dynamic assessment procedure for young children, the ACFS, with twenty-six preschool children, with and without disabilities.

The results showed that there was a significant gain between the pre and post test scores for the subtests classification, perspective taking, verbal planning and pattern completion in addition to the total ACFS score. (See Table 1.) However, interpretation of this finding is limited because of the lack of a control group of non- mediated students. Therefore, the gain can not be securely attributed to mediation, that is practice effects have not been ruled out. However, the significant gains do support the scales's construct validity.

The two subtests that do not show significant gains both involve memory. This finding contrasts with the first ACFS study (Lidz, personal communication) with high functioning preschool children. In that study, the pre to post test gains on these same memory tasks were highly significant. It is possible that performance on these subtests differs between populations of children with and without special needs. If so, this finding would have diagnostic value and should be further investigated.

The second question this study addresses is whether there is a significant relationship between the child's behavior during the mediation and the child's ACFS posttest score. The assumption that one's behavior during the mediation phase will affect task performance was true for the subtests during which the children need to pay full attention and concentrate on the task to succeed on the posttest (visual memory, verbal planning and pattern completion). (See Table 2.) The nature of these relationships may be more complex than can be addressed by this study.

The third question this study addresses is whether there is a significant relationship between a specific behavior demonstrated during the mediation phase and the ACFS task total posttest score. According to the pearson product moment correlation computed to test this relationship (Table 3), the most significant correlation with the posttest score was the behavior of flexibility. This is not surprising as flexibility measures the extent to which a child can self correct and use alternative solutions to solve the task - a skill that is exactly what the ACFS professes to measure. Other behaviors that are significant include persistence - which demonstrates how much a child is willing to continue with the task at hand and frustration tolerance which similarly, demonstrates to what extent the child is willing to work through the challenging task. Both of these behaviors are crucial to the successful completion of the task.

The fourth question this study addresses is whether there is a significant relationship between the ACFS score and a traditional IQ score as measured on the Differential Ability Scales. A curious result of all the pearson products moment correlations computed to determine this relationship is that they were all in the negative direction. Although there is no apparent explanation for this result, one can question the scores used to test this hypothesis. The IQ score used was the most recent IQ score found in the child's file, which often was a year or two before the child's ACFS score. Perhaps because of this time span between the child's IQ score and ACFS score, there was no significant relationship between the two scores. This question can be further investigated in another study where the children are given an IQ measure and the ACFS measure within a short time span.

Another explanation for this negative correlation may be due to the processes the DAS and ACFS measure. They could be measuring two different processes.

The fifth question this study addresses is the determination of the intratest reliability of the behavior observation scale. Looking at Table 4, it is interesting to note that all of the behaviors contribute significantly to the total behavior score except for interactivity. Interactivity measures the child's interaction with the mediator, a behavior - judging from this pearson product moment correlation - that does not affect the total behavior score.

The last question of this study asks: Does the ACFS differentiate between children with special needs and those with typical development? This independent sample t-test did not produce any significant results. This is probably due to the large discrepancy in the number of regular education children (five children) in relation to the number of children with special needs (twenty-one). In addition, the author of the study assumed (perhaps incorrectly) that the children labeled regular education did not have any special needs - an assumption that was not validated as these children were never screened for disabilities.

Conclusion

This study provides moderate support for the validity and reliability of the ACFS. The pre to post test gains for four of the six subtests offers evidence of construct validity, limited by the absence of a control group. The lack of significant gain on both memory subtests may have diagnostic utility for discriminating between children with and without special needs.

The behavior rating scale shows integrity as a scale, with the significant contribution of all but one component.

The significant positive relationship between scores of the behavioral components and the children's task competence begins to explore the internal validity of the scale with information that may eventually inform interpretation of results.

The study did not document performance differences between children with and without special needs, related to the very low N of children without documented disabilities.

APPENDIX A

Dear Parent,

Crossroads School for Child Development has been assisting Dr. Carol Lidz, a leader in psychology, in developing a dynamic assessment measure. This measure follows a format of test-teach-retest. Meaning, the child does a task, the assessor teaches the child how to improve his/her ability to do the task, and then the child does the task again. This test is child friendly and fun to do. We started this project last year in conjunction with Dr. Lidz, and the school has been very pleased with the results. As Dr. Lidz's student I would like to continue this project. This project involves working one on one with the child (outside of the classroom) for about an hour a session, over two sessions. I'll be working under Dr. Jay Silverstein's supervision and all results will remain confidential. Prior to beginning testing, I will call to get your consent. Participation is, of course, voluntary.

Sincerely,

Ruth Shurin, B.A.
Psychology Intern

Jay Silverstein, Ph.D.
Licensed Psychologist

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